Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**Unit 6, Part 3 (Protein Synthesis and Mutations) – Learning Targets**

Pre-AP Biology, Mrs. Krouse

**What will I be able to do when I’ve finished this lesson, and what must I Iearn so I can do this?**

* I can describe the differences between DNA and RNA.

*I can compare the following aspects of DNA and RNA structure: number of chains of nucleotides (aka strands), type of pentose sugar, and types of nitrogen bases*

*I can compare the three types of RNA (mRNA, tRNA, and rRNA) based on their shape, location, and purpose in protein synthesis. I can identify an image of each type of RNA.*

* I can identify and order the steps involved in transcription

*I can describe how RNA polymerase builds an mRNA strand using free RNA nucleotides and the instructions on the DNA template strand.*

* I can explain the purpose of molecules and cell structures used in transcription.

*Molecules and cell structures I need to know: DNA template strand, RNA polymerase, free RNA nucleotides, mRNA, nucleus, nuclear pore*

*I can label the molecules and cell structures listed above on a diagram of transcription.*

*I can identify the reasons why DNA cannot leave the nucleus (resulting in the need for mRNA).*

* I can identify and order the steps involved in translation.

*I can describe how tRNA is used to assemble a polypeptide (i.e. chain of amino acids) based on the instructions in mRNA.*

* I can explain the purpose of molecules and cell structures used in translation.

*Molecules and cell structures I need to know: ribosome, mRNA, codon, tRNA, anticodon, amino acid, peptide bond, polypeptide*

*I can label the molecules and cell structures listed above on a diagram of translation.*

* I can use a codon chart to determine a protein sequence based on an mRNA code.

*Before I do this, I must be able to transcribe an mRNA sequence from a given sequence on the DNA template strand.*

*I can use a square OR circular codon chart to identify the amino acids in a polypeptide based on mRNA codons.*

* I can compare / contrast the different types of DNA mutations, and I can predict the effect of DNA mutations on the resulting protein.

*I can describe the difference between gene mutations and major chromosomal mutations.*

*I can describe the difference between the two types of gene mutations—point mutations and frameshift mutations.*

*I can describe the difference between the three types of point mutation—silent, missense, and nonsense—based on the effect on the resulting polypeptide.*

*I can describe the difference between the two types of frameshift mutation—insertion and deletion.*

*I can transcribe and translate a mutated DNA sequence to determine the type of point or frameshift mutation that occurred.*

*I can describe the difference between the types of major chromosomal mutation—duplication, inversion, insertion, translocation—and be able to identify each type in a diagram.*